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ABSTRACT

A home assessment measure was developed as an economical alternative to parent interviews. The 48 items measured five factors: parent expectations and aspirations; family activeness; independence; language development; and support of school and education. Correlations with standardized reading and mathematics achievement tests were based on individual items or on total scores of the home assessment measure. Overall, 40% of the partial correlations were in the expected direction for the pilot group of third grade students from a suburban, desegregated public school. Reliability of the measure was moderate for the main study group, grades 5 to 8, from an inner-city parochial school. Correlations for this group lacked the expected strong positive relationship; when reconsidered by grade level, the percentage of partials in the expected direction was higher. (CP)

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Development of A Home Assessment Measure

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Abstract

This paper describes the development and subsequent use of a home environment questionnaire measure. The instrument was developed in an action setting by teachers, administrators and university researchers in order to provide an efficient, inexpensive substitute for lengthy, expensive interviews generally used to assess home environment. Strengths and weaknesses of the instrument are discussed in terms of the process of its development and in relation to the standardized achievement scores (vocabulary, reading, math concepts and computation) of two groups of students. The pilot study group was drawn from a suburban, desegregated public school system; the main study group from an urban, inner-city, parochial school. Suggestions are included for revision of the instrument and for strengthening future research based on the study findings.

Development of A Home Assessment Measure

Home environment is one of a series of educational productivity factors discussed in Walberg's (1980) model of educational productivity. The factors are hypothesized to exist in multiplicative relation to each other as predictors of achievement. As any factor approaches zero, its effect on overall achievement becomes deleterious. Raising an individual's weakest factor increases achievement logarithmically; raising a factor which is already strong, serves to boost achievement only weakly. Working from this model, researchers explored the development of convenient and inexpensive measures of the productivity factors in order to be able to produce achievement profiles for students. This development was a cooperative effort between teachers, parents, administrators and university researchers based on prior research mediated by immediate, practical concerns. The profiles of achievement resulting from such an effort would be used to help direct time and resources most efficiently in raising student achievement scores.

Method

Background

This paper discusses the development of a home assessment measure as described briefly above, and its relationship to achievement. The definition of home environment for the purposes of this study is largely psychosocial, assessing parents' actions and typical family or parent-

child interactions based on salient points from prior research, and is discussed in detail in the next section. After its development, the home environment instrument was tested out during 1977-8 and 1978-9. The findings presented are tentative and the results are reported in terms of signs and expected direction of relationships, not as inferential statistics, for two main reasons. The first deals with the action setting of the research, where the immediate problems and interests of participants temper theoretic and measurement concerns. Parents, especially, tended to consider the child's feelings and perceptions in individualistic forms where researchers focused on more general, and generalizable characteristics of children and their familes. Compromises were made within both groups in order to produce the assessment instrument. By addressing a problem in a specific setting, some generalizability is lost (Corey, 1953). The university researchers involved in this study had to balance the desires of the client or collaborative group (parents, teachers and administrators) with sound approaches to quasi-experimental methodology, exchanging information of practical value with clients in return for data with which to test scientific or theoretic statements, maintaining equilibrium and balance between these ends.

The second constraint on the research findings involves the sample, which is drawn from an inner-city parochial school serving an integrated, 1st to 8th grade population. The students are fairly typical in ability, income, achievement and other characteristics of students in such

settings. However, they do represent a self-selected group and, furthermore, instead of producing independent measures of the variables (e.g., home environment, vocabulary achievement, etc.) over time, produce interdependent, non random measures (individual A's score at $time_1$, is related to individual A's score at $time_2$). However, using prior research as a guide, the results of the study can do more than guide the practitioners initially involved (no mean feat in itself). They can serve to support or contradict prior findings, as a supportive though nonconclusive replication technique, "...circumscribed by locale and time..." (Shaver & Norton, 1980). And though observations on individuals from year-to-year are not completely independent, the repeated measures aspect of the study can likewise be cast as a replication where noninferential findings, which are not subject to assumptions of randomness, are reported. The background of the instrument development will be presented in the next section, followed by a discussion of the findings.

Instrument Development

Based on prior research (Iverson & Walberg, 1979; White, 1976), the initial approach to home environment was not based on socioeconomic status (SES) measures nor on parental values or attitudes alone but on a psychosocial view of home environment. This assumes that parental actions are important determinants of the home environment climate in relation to school and school achievement.

The general model of educational productivity (Walberg, 1980) and specific aspects of research on the relationship of home environment and

school achievement were presented to a group of parents and school staff (2 parents; 2 counselors; 2 principals; 3 teachers; 2 university researchers). A questionnaire format was specified from the outset owing to concerns of time and money. An interview, typically lasting an hour, may cost 100 times as much as a questionnaire to administer. A dichotomous (yes, no) format was chosen for the sake of simplicity, and in light of the group's judgement of parental reading ability, as the instrument would be completed by parents themselves, not students or teachers. This led to oversimplication of some questions and to a lack of measurement precision and sensitivity which serves to mask differences, and weaken results, and as discussed in the final section, will be changed in a revision of the home environment measure. The instrument development group did not want to alienate parents through a complex overly technical assessment instrument. Tradeoffs at the point between the accuracy and power versus the cost and efficiency of such a simplified questionnaire compared to lengthy, complex interview assessments (over 100 items) found more effective in previous research (Dave, 1968; Iverson & Walberg, 1979; Marjoribanks, 1979) were acknowledged, discussed and operationalized by the group involved in the action research (Corey, 1953). The group therefore considered their own immediate and often practical considerations to take a higher priority than "pure research" or measurement questions.

An example of this process is the instrument's length, 48 questions, which is about half the number items as has been used in other assess-

ments. This choice being determined by the practical question of how long parents would be willing to take to fill out such an instrument. Parents in the instrument development group suggested that when examples of magazines were supplied in a question concerning home resources, that Ebony and other minority publications be included as well as Family Circle. The value of such a process lies in the greater understanding between parents, teachers, and administrators it fosters (Corey, 1953). The importance of the group dynamic and personal involvement in problem formulation, as well as some problems associated with this kind of research are critiqued and discussed at length elsewhere (Hodgkinson, 1957; Corey, 1953; Schubert, 1980).

In the specific situation, teachers began to discuss how they could involve parents to a greater extent, eventually working on "idea books" and "home recipes" (ideas for parental involvement and worksheets designed for parent and child to complete together). Several teachers began to discuss educational issues more openly with parents, at the instrument development group and outside of school, by phone and in person. Two parents volunteered in their childrens' schools and were helping throughout the school, not only their childrens' classrooms. Several parents dropped out of the group because they felt the discussions were too complex or difficult, deisgned more for teachers and administrators. However after the group confronted this issue, one of these parents returned to the group to try again, and remained until the end. One mother formed a parent group in her neighborhood, aided by one of the

university researchers.

The instrument development group completed the questionnaire with a new sense of cooperation and interest in what each member could do to foster school achievement. The questionnaire was then administered to a group of students; results are reported next.

Results

Though the individual items were initially selected based on prior research (Dave, 1968) identifying five factors of home environment (parent expectations and aspirations, family activeness, independence, language development and support of school and education), a factor analysis of the questionnaire items proved to be inconclusive. Therefore, later analysis are based on individual items or on total scores. The total score is derived by adding or substracting items based on whether they were positively or negatively worded (only item 14 was negative). Each item received equal weight. The average total score for 1977-78 is 51.1 (N=50) and for 1978-9 is 51.5 (N=75).

Table 1 shows partial correlations, controlling for prior achievement for the pilot study group (1977-8) and for the main study group (1977-8, 1978-9). The pilot study group is drawn from 3rd grade parents who returned a questionnaire from an integrated, mixed SES, suburban school district and is used in only this analysis. The main study is drawn from the integrated, inner-city parochial school, described previously, and includes 5th-8th graders for the analysis.

Insert Table 1 about here.

The reading achievement measures reported in Table 1 are reading comprehension and math total achievement. These correlations were examined for consistency, strength and sign. Consistent items (in terms of signs) for both groups on the repeated measures are: for reading, 3, 10, 14, 16, 17g, 23, and 31; for math, 2, 3, 5, 16, 17h, 23, 35, 41. Item 3 (child brings home library books from school) was consistently negative (unexpected direction) through all partial correlations. Perhaps poorer students are required to bring more books home from school, or elect to study more than higher achievers. Item 23, also consistent across measures (attended Open House) is in the expected direction.

Overall, 40% of these partial correlations of home assessment item were in the expected direction for the pilot study. Thirty-one (1977-78) and fifty percent (1978-79) of the items are in the expected direction for the main study group. For math assessment, thirty-one percent (pilot group), 60% (1977-78) and 42 (1978-79) of the item correlations are in the expected direction. Overall, 46% of the items are in the expected direction. The dichotomous format which does not optimize parental choice of responses or variability may partly account for this percentage, especially in light of the relatively small sample size.

The remaining findings are based solely on the main study group. Table 2 presents the Pearson correlations of items with themselves, in rank order from highest to lowest. Thirty-nine (81%)

are in the expected direction; five had no variability, and a coefficient wasn't calculated. This ordering will be used in the instrument revision to choose items suitable to a questionnaire format. Item 14 (child watches TV without parent) is the item with a negative value for a "yes" response.

Insert Table 2 about here.

The Pearson correlation of the total scores of the main study group for 1977-8 and 1978-9 of .56 ($p < .003$) represents a measure of stability reliability. The internal consistency scores (alpha reliabilities) are .65 (77-78) and .70 (78-79). These moderate values are consistent with prior research, and may suggest that overall home environment is changeable and possibly changeable through deliberate action (Iverson & Walberg, 1979, Marjoribanks, 1979).

The next analysis examines partial correlations of the home environment total score and the achievement measures for the main study group. Few prior studies have reported correlations which control for the influence of prior achievement on current achievement. These partial correlations are presented in Table 3. For vocabulary, the mean correlation is slightly positive (.10). For reading and the two math measures, the average correlations are slightly negative ($\bar{x}$ reading = -.11; $\bar{x}$ math concepts = -.22; $\bar{x}$ math computations = -.04). Within the individual partial correlations, where the home total score and achievement measure were concurrent i.e., as with total score 1978 with 1978 vocabulary),

several patterns appear. For reading, the correlations show agreement in sign and are similar in strength, -31 (78 with 78) and -21 (79 with 79). Likewise with math computations, the partials are in the same direction (-18 for 78 with 78 and -02 for 79 with 79). These results may be attributable to the percentage (46%) of items in the expected direction and is expected to shift to a positive direction after instrument revision.

Insert Table 3 about here.

As these results do not indicate a strong relationship in the expected direction, the partial correlations were reconsidered by grade level. This removes some possibility of masking of effects due to age or grade-related differences between the whole group.

Table 4 presents the partial correlations for 5th-8th grades both separately and divided into an intermediate (5-6) and upper level (7-8)

Insert Table 4 about here.

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group. The percentage of partials in the expected direction for the achievement measures are: vocabulary and math concepts 63%; reading 50%; math computations 44%. When intermediate and upper level groups are analyzed, 75% (vocabulary) and 50% (reading, math concepts and computations) of the partial correlations are in the expected direction. This is close to a chance level, however, student ability and motivation may influence home environments, "causing" home assessment scores instead

of achievement scores. The bright child may "cause" his parents to provide a stimulating environment through requests and behavior. Randomized interventions can help provide greater certainty about causal directionality.

Discussion

The results of these analysies are somewhat site specific, as has been mentioned previously. What is traded off in terms of generalizability is compensated for in terms of results that are beyond the scope of commonly used assessment instruments, such as better community relations, a raising of parent confidence and sense of power, a greater concern and consciousness of weaknesses and strengths of the school on the part of parents teachers.

The results which were based on the data collected are useful to parents and educational practitioners in similar schools, such as the parochial school where the instrument was tested out. Individual items positively associated with achievement measures provided focus for parent-teacher discussions at both the schools discussed. At the parochial school, Parent Clubs based on other action research (Henning, 197) used items to inform their action and direct their activities.

Conclusions

Though partial correlations of total home scores were contradictory, the associations with vocabulary measures over several years suggest a first curricular focus for parent-educator-groups wishing to proceed incrementally. Revisions of the instrument based on this research will

attempt to include better discrimination of qualitative differences between homes, as a simplified "wrong or right" approach appears to capture only a small portior of home environment characteristics. Randomized interventions in future research may be employed in order to look more carefully at the direction and strength of causal links between home environment and school achievement measures.

TABLE 1 Comparison of Item Partials - Pilot to 1978-1979

ITEM	READING ACHIEVEMENT PILOT	78(77)	79(78)	MATH ACHIEVEMENT PILOT	78(77)	79(78)
1. Child has library card.	21 (31)	-28 (03)	01 (48)	-06 (42)	04 (39)	-26 (06)
2. School a good experience.	02 (21)	-11 (24)	08 (32)	04 (32)	08 (31)	11 (27)
3. Brings home library books.	-06 (73)	-25 (06)	-16 (17)	-14 (08)	-30 (03)	-12 (24)
4. Shares feelings with parent.	---	-11 (25)	10 (27)	---	05 (39)	-24 (07)
5. Parent has library card.	06 (51)	-19 (12)	16 (18)	-14 (53)	-11 (25)	-11 (26)
6. Parent been to library this year.	32 (.05)	11 (25)	04 (41)	00 (63)	-16 (15)	-27 (05)
7. Child feels good about self.	---	07 (34)	-06 (37)	---	05 (37)	-06 (35)
8. Call teacher for questions.	00 (46)	06 (36)	-37 (01)	15 (17)	07 (33)	-20 (11)
9. Parent speaks to teacher about school.	20 (48)	-02 (44)	-04 (46)	-31 (10)	07 (34)	18 (14)

TABLE 1 Comparison of Item Partials - Pilot to 1978-1979 (Cont'd)

ITEM	READING ACHIEVEMENT PILOT	78(77)	79(78)	MATH ACHIEVEMENT PILOT	78(77)	79(78)
10. Knows child's best subject.	---	-15 (17)	-10 (27)	---	07 (33)	23 (11)
11. Knows child's weaknesses.	12 (21)	-15 (16)	-32 (02)	25 (49)	07 (33)	-16 (08)
12. Knows how child's work compares to other students.	-01 (19)	14 (18)	-15 (18)	-14 (17)	-22 (08)	08 (31)
13. Read in front of child.	-07 (23)	01 (47)	-25 (06)	23 (26)	-15 (17)	-13 (22)
14. Child watches TV without parent.	-03 (29)	-10 (26)	-15 (18)	26 (10)	-21 (10)	23 (08)
15. Joke with child.	-06 (42)	-10 (27)	18 (13)	11 (13)	12 (22)	22 (09)
16. Child tells school problems.	-06 (17)	-24 (06)	-16 (07)	12 (16)	07 (34)	-20 (13)
17a. Have dictionary	---	---	---	---	---	---
17b. Have Atlas	10 (14)	06 (35)	-08 (30)	07 (32)	-24 (06)	09 (20)
17c. Have encyclopedia	12 (18)	-08 (31)	-05 (37)	-22 (23)	08 (31)	30 (03)

TABLE 1 Comparison of Item Partials - Pilot to 1978-1979 (Cont'd)

ITEM		READING ACHIEVEMENT PILOT	78(77)	79(78)	MATH ACHIEVEMENT PILOT	78(77)	79(78)
17d.	Have newspapers	---	21 (09)	-14 (20)	---	02 (44)	09 (28)
17e.	Have children's magazines	11 (25)	-16 (16)	-02 (45)	13 (28)	-16 (16)	-27 (05)
17f.	Have coloring books, crayons	---	-02 (44)	-11 (28)	---	01 (48)	04 (42)
17g.	Have drawing paper	05 (32)	05 (36)	12 (24)	-05 (41)	08 (31)	23 (08)
17h.	Have magazines	27 (10)	-18 (13)	09 (30)	08 (36)	07 (32)	24 (07)
18.	Feel free to visit school	06 (49)	-28 (04)	-05 (37)	10 (25)	01 (47)	-33 (02)
19.	Plan to go on family outings	-25 (16)	-21 (10)	25 (06)	-18 (17)	05 (39)	-01 (48)
20.	Child plans trip	-20 (34)	-01 (47)	44 (00)	-23 (29)	06 (36)	-12 (24)
21.	Parent would volunteer	06 (19)	-03 (43)	08 (31)	-08 (33)	09 (30)	-18 (14)
22.	Child has chores	-21 (34)	-14 (20)	26 (05)	-35 (.05)	-26 (06)	23 (08)

TABLE 1 Comparison of Item Partials - Pilot to 1978-1979 (Cont'd)

ITEM		READING ACHIEVEMENT PILOT	78(77)	79(78)	MATH ACHIEVEMENT PILOT	78(77)	79(78)
23.	Attended open house.	26 (10)	01 (48)	32 (02)	07 (36)	06 (36)	23 (08)
24.	Confortable visiting school.	---	---	-13 (21)	---	---	14 (19)
25.	Been to P-T Conference.	---	-41 (00)	20 (11)	---	07 (33)	-17 (16)
26.	Pass on nice things said about child.	---	-31 (03)	---	---	05 (39)	---
27.	Discuss future with child.	-20 (18)	---	-13 (22)	-20 (15)	---	-03 (42)
28.	Knows what teachers expects of child.	-37 (05)	-26 (06)	07 (33)	-15 (12)	08 (31)	23 (08)
29.	Child can do expected work.	-02 (51)	-22 (09)	-08 (31)	-13 (20)	04 (41)	09 (29)
30.	Child help around home.	-13 (19)	-15 (17)	27 (05)	-10 (23)	07 (33)	27 (05)
31.	Worked as school volunter	32 (09)	06 (36)	04 (41)	20 (19)	15 (18)	-17 (15)
32.	Visited museum or zoo.	09 (18)	-18 (13)	06 (35)	15 (21)	-23 (08)	-27 (05)

TABLE 1 Comparison of Item Partials - Pilot to 1978-1979 (Cont'd)

ITEM	READING ACHIEVEMENT			MATH ACHIEVEMENT		
	PILOT	78(77)	79(78)	PILOT	78(77)	79(78)
33. Hope child continues education	---	17 (15)	---	---	02 (46)	---
34. Child in a book club	17 (41)	-02 (45)	19 (12)	03 (41)	-07 (34)	-23 (08)
35. Reading to Child	-34 (05)	01 (48)	-00 (49)	-57 (01)	-15 (19)	-29 (04)
36. Expect child to continue education.	---	17 (15)	17 (15)	---	-30 (03)	02 (46)
37. Help child with school work.	---	13 (22)	-03 (41)	---	-01 (47)	-34 (02)
38. Praise child for school work.	---	---	14 (20)	---	---	-07 (35)
39. Have plans for child's future.	20 (09)	27 (05)	-12 (23)	30 (18)	-34 (02)	01 (48)
40. Connect child's speech.	06 (35)	-02 (45)	02 (45)	-21 (19)	08 (31)	08 (31)
41. Taught child new words.	-27 (10)	-18 (14)	04 (41)	-16 (12)	-17 (33)	-04 (41)

Table 2

Item Intercorrelation of (78 with 79)

#	ITEM	r
36.	Expect child to continue education.	87
18.	Feel free to visit school.	79
17a.	Have a dictionary at home.	63
17b.	Have an Atlas at home.	69
02.	School good experience - parent.	62
19.	Plan to go on family outings.	60
17c.	Have an encylopedia at home.	60
39.	Have plans for child's future.	68
95.	Parent has library card.	54
32.	Visited museum or zoo.	54
17h.	Have magazines at home.	51
17e.	Have children's magazines	50
29.	Knows what teacher expects of child.	50
41.	Taught child new words this month.	46
31.	Worked as a school volunteer	45
17f.	Coloring book, crayons at home.	44
03.	Brings books from school.	42
35.	Read to child past month	42
10.	Knows child's best subject.	40
16.	Child tells of school problems.	39
11.	Knows child's weak subject	37
14.	Child watches TV without parent.	35
12	Knows how child's work compares to peers.	34
13	Read in front of child (past month).	32

Table 2 (Cont'd)

#	ITEM	r
06.	Parent been to library this year.	32
15.	Joke with child.	32
17g.	Have drawing paper.	32
23.	Attended open house.	29
30.	Child helped around house.	29
07.	Child feels good about self.	23
01.	Child has library card.	21
21.	Parent would volunteer.	16
17d.	Have newspaper	13
08.	Call teacher for questions.	12
29.	Child can do expected work.	12
22.	Child has chores.	10
34.	Child in a book club.	10
20.	Child plans trip.	04
40.	Correct child's speech.	03
25.	Been to P-T Conference.	00
24.	Comfortable visiting school.	-03
04.	Shares feelings with parent.	-16
09.	Parent speaks to teacher about school.	--**
26.	Pass on nice things said about child.	--
27.	Discuss future with child.	--
33.	Hope child continues education.	--
37.	Help child with school work.	--

Table 2 (Cont'd)

#	ITEM	r
38.	Praise child for school work.	--

* decimal omitted

** Coefficent could not be computed due to lack of variation in answer choices.

Table 3

Partial Correlations: Total Home Scores and Achievement Measures

	Total 78	Total 79	Controlling For
Gevoc 78	16(18)	54(00)	Gevoc 77
Gevoc 79	-24(10)	-05(39)	Gevoc 78
($\bar{x}$ = .10)			
Gercom 78	-31(03)	-04(42)	Gercom 77
Gercom 79	14(23)	-21(10)	
($\bar{x}$ = -.11)			
Gemcon 78	-26(06)	12(25)	Gemcon 77
Gemcon 79	-04(43)	09(29)	Gemcon 78
Gemcom 78	-18(13)	07(35)	Gemcom 77
Gemcom 78	-04(42)	-02(45)	Gemcom 78
($\bar{x}$ = .04)			
Gevoc 79	-30(07)	-06(38)	Gevoc 77, 78
Gercom 79	06(38)	-13(23)	Gercon 77, 78
Gemcon 79	04(42)	02(46)	Gemcon 77, 78
Gemcom 79	-28(09)	-11(26)	Gemcom 77, 78

Table 4

Partial Correlations by Grades (5-8)

	5th		6th		7th		8th	
	78	79	78	79	78	79	78	79
Gevoc 78(77)	-07	64	89	69	-14	53	37	10
Gevoc 79(78)	-49	17	-76	-86	22	07	-30	39
Gercom 78(77)	-80	20	03	-48	-41	-07	-11	-24
Gercom 79(78)	06	53	74	17	-14	07	13	-32
Gemcom 78(77)	29	26	-44	03	15	20	-44	25
Gemcom 79(78)	-49	39	54	-15	-26	-48	33	09
Gemcon 78(77)	15	77	-02	12	-54	-27	-01	43
Gemcon 79(78)	62	60	63	-54	36	-23	12	-14

	5th and 6th		7th and 8th	
	78	79	78	79
Gevoc 78(77)	44	78	21	22
Gevoc 79(78)	-49	-14	01	21
Gercom 78(77)	-38	07	-25	-14
Gercom 79(78)	31	00	01	-22
Gemcom 78(77)	-55	11	-19	-01
Gemcom 79(78)	-06	31	17	20
Gemcon 78(79)	-28	00	-25	33
Gemcon 79(78)	-07	25	20	-10

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